Status of the Claims

Applicants wish to thank Examiner Forman for extending the courtesy of the telephonic interview held on October 30, 2002 with Applicants' representative Dr. Jeffry S. Mann. During the interview, Dr. Mann was informed that an Office Action had purportedly been mailed on September 17, 2002. Since neither Applicants nor Applicants' representative had received a copy of the Office Action, the Examiner agreed to send a copy of the Office Action to Dr. Mann by facsimile. Applicants thank Examiner Forman for her time.

After entry of this amendment, claims 1-3, and 5-51 are pending. Claim 4 has been canceled without prejudice to future prosecution. Claims 1-3, 5-7, 10, 22, 30-33, and 37 have been amended. New claims 40-51 have been added. The amendments do not introduce new matter or raise new issues that would require further consideration and/or search.

Amended, claims, 1, 10, 30, 31, 32, and 37 are directed to methods of counting single copies of target species and recite "detecting an optical characteristic emitted by a first quantum dot and a second quantum dot attached to said single copy" and "wherein said first quantum dot is distinguishable from said second quantum dot." Support for these amendments is found throughout the specification, for example, on page 6, lines 13-25; page 13, line 32; page 18, lines 28-29; and page 19, line 12 to page 22, line 15. Thus, no new matter is added by these amendments. Amended, claim 33 recites "detecting an optical property emitted by a third quantum dot and a fourth quantum dot attached to said single copy" and "wherein said third quantum dot is distinguishable from said fourth quantum dot." Support for this amendment is found throughout the specification and claims as originally filed (*see, e.g.*, page 18, line 16 to page 22, line 15).

Claims 2, 3, 10 have been amended to ensure proper antecedent basis in light of the amendment to claim 1.

Claims 5-7 have been amended to ensure proper claim dependency in light of the cancellation of claim 4.

Claim 22 has been amended to correct a grammatical error.

New claim 40 recites "wherein said optical characteristic is detected by coincidence detection." Support for this amendment is found throughout the specification (*see, e.g.*, page 7, lines 17-26).

New claims 41-46 recite "wherein said optical characteristic is fluorescence." Support for these amendments is found throughout the specification and claims as originally filed (*see, e.g.*, page 14, lines 1-20).

New claims 47 and 48 recite "resolving said optical characteristic from said first quantum dot and said second quantum dot attached to said single copy from an optical characteristic arising from a quantum dot not attached to said single copy." Support for these amendments is found throughout the specification, for example, on page 23, lines 19-22.

New claim 49 recites "further wherein said probing resolves said optical characteristic of said first quantum dot and said second quantum dot from an optical characteristic of other members of said population of target species immobilized on said substrate." New claim 50 recites "further wherein said probing resolves said optical characteristic of said third quantum dot and said fourth quantum dot from an optical characteristic of other members of said population of target species immobilized on said substrate." New claim 51 recites "wherein said probing resolves the optical characteristic of said first quantum dot and said second quantum dot from other members of said population and from each other." Support for these amendments is found in claims 32, 33, and 37 as filed.

A version of the claims with markings to show changes to the claims are provided in Appendix A. All of the pending claims are provided in Appendix B for the Examiner's convenience.

Rejection For Obviousness-Type Double Patenting

Claims 1-39 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-43 of

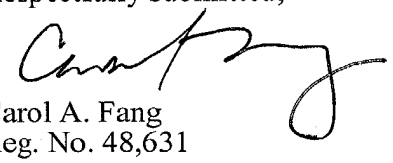
copending application No. 09/784,645. Since the application and the cited copending application are commonly owned, Applicants will submit a terminal disclaimer to overcome this rejection after it has been determined that the pending claims in the application and the copending application are otherwise allowable.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (Twice amended) A method of counting a single copy of a target species immobilized on a substrate, said method comprising:

(i) detecting a single copy of said target species by detecting an optical characteristic of [fluorescence emitted by] a first quantum dot and a second quantum dot attached to said single copy, wherein said single copy is bound to an affinity moiety for said target species immobilized on said substrate, and further wherein said first quantum dot is distinguishable from said second quantum dot [and

(ii) resolving said fluorescence from said quantum dot attached to said single copy from fluorescence arising from a quantum dot not attached to said single copy], thereby counting said single copy.

2. (Once amended) The method according to claim 1, wherein said first quantum dot [is] and said second quantum dot are attached to said target species prior to binding said target species to said affinity moiety.

3. (Once amended) The method according to claim 1, wherein said first quantum dot [is] and said second quantum dot are attached to said target species after binding said target species to said affinity moiety.

4. Cancel

5. (Once amended) The method according to claim [4] 1, wherein binding of said target species to said affinity moiety forms a target species-affinity moiety complex that is detected by fluorescence from both said first quantum dot and said second quantum dot attached to said target species-affinity moiety complex.

6. (Once amended) The method according to claim [4] 1, wherein said first quantum dot and said second quantum dot are distinguishable by [a] an optical characteristic which is a member selected from the group consisting of fluorescence spectrum, fluorescence emission, fluorescence excitation spectrum, ultraviolet light

absorbance, visible light absorbance, fluorescence quantum yield, fluorescence lifetime, light scattering and combinations thereof.

7. (Once amended) The method according to claim [4] 1, wherein said first quantum dot and said second quantum dot are visually distinguishable as a first color and a second color, respectively.

8. The method according to claim 7, wherein said first color and said second color combine to form a visually or electronically distinguishable color different from both said first color and said second color.

9. The method according to claim 1, wherein said target species has *n* quantum dots attached thereto, wherein each of said *n* quantum dots is distinguishable from each other, and *n* is an integer from 3 to 10.

10. (Twice amended) The method according to claim 1, wherein said first quantum dot [is] and said second quantum dot are attached to a targeting moiety for said target species, said targeting moiety being a member selected from the group consisting of antibodies, aptamers, proteins, streptavidin, nucleic acids and biotin.

22. (Twice amended) The method according to claim 19, wherein said alignment moiety identifies the position of one or more target moiety-affinity [complex] complexes.

29. (Twice amended) A method of counting a single copy of a target species in solution, said method comprising

(i) detecting a single copy of said target species by detecting essentially simultaneously [fluorescence] an optical characteristic of [emitted by] a first quantum dot of a first color attached to said single copy and a second quantum dot of a second color attached to said single copy, wherein said first color and said second color are distinguishably different colors[, and

(ii) resolving said fluorescence emitted by said first quantum dot of a first color attached to said single copy and said second quantum dot of a second color attached to

said single copy from fluorescence arising from a quantum dot not attached to said single copy], thereby counting said single copy.

30. (Twice amended) A method of counting a single copy of a target species immobilized on a substrate, which species is a member of a population of target species immobilized on said substrate with spacing between each member of said population, said method comprising:

(i) detecting a single copy of said target species by detecting [fluorescence] an optical characteristic of [emitted by] a first quantum dot and a second quantum dot attached to said single copy, wherein said single copy is bound to an affinity moiety for said target species immobilized on said substrate, wherein said first quantum dot is distinguishable from said second quantum dot, and further wherein said detecting is performed with a detecting means having a resolution that is higher than said spacing between each member of said population[, and

(ii) resolving said fluorescence emitted by said quantum dot attached to said single copy from fluorescence arising from a quantum dot not attached to said single copy], thereby counting said single copy.

31. (Twice amended) A method of counting a single copy of a target species immobilized on a substrate, which species is a member of a population of target species immobilized on said substrate, said method comprising:

(i) detecting a single copy of said target species by detecting [fluorescence] an optical characteristic of [emitted by] a quantum dot attached to said single copy, wherein said first quantum dot is distinguishable from said second quantum dot, and further wherein said single copy is bound to an affinity moiety for said target species immobilized on said substrate forming a target-affinity moiety complex, and said detecting is performed with a detecting means having a resolution limited region of interest whereby, less than one target-affinity moiety complex is present within each resolution limited region of interest[, and

(ii) resolving said fluorescence emitted by said quantum dot attached to said single copy from fluorescence arising from a quantum dot not attached to said single copy], thereby counting said single copy.

32. (Twice amended) A method of counting a single copy of a first target species immobilized on a substrate, which species is a member of a population of target species immobilized on said substrate, said method comprising:

(a) defining a first region of interest of said substrate; and

(b) probing said first region of interest for [fluorescence] an optical characteristic of [emitted by] a first quantum dot and a second quantum dot attached to said single copy of said first target species bound to an affinity moiety for said first target species immobilized on said substrate, wherein said first quantum dot is distinguishable from said second quantum dot, [wherein said probing resolves said fluorescence from said quantum dot from fluorescence arising from other members of said population of target species immobilized on said substrate,] thereby counting said first target species.

33. (Twice amended) The method according to claim 32, further comprising counting a single copy of a second target species immobilized to said substrate, said method comprising:

(c) defining a second region of interest of said substrate; and

(d) probing said second region of interest for [fluorescence] an optical characteristic of [emitted by] a [second] third quantum dot and a fourth quantum dot attached to said single copy of said second target species bound to an affinity moiety for said second target species immobilized on said substrate, wherein said third quantum dot is distinguishable from said fourth quantum dot, [wherein said probing resolves said fluorescence from said second quantum dot from fluorescence arising from other members of said population of target species immobilized on said substrate,] thereby counting said second target species.

37. (Twice amended) A method for counting multiple target species immobilized on a substrate, which species are members of a population of target species immobilized on said substrate, said method comprising:

(a) defining multiple regions of interest on said substrate; and

(b) probing said multiple regions of interest for [fluorescence] an optical characteristic of [emitted by] a first quantum dot and a second quantum dot attached to a single copy of said target species bound to an affinity moiety for said target species immobilized within a region of interest of said substrate, [wherein said probing resolves fluorescence from said quantum dot from other members of said population and from each other,] thereby counting multiple target species.

40. (New) The method according to claim 1, wherein said optical characteristic is detected by coincidence detection.

41. (New) The method according to claim 1, wherein said optical characteristic is fluorescence.

42. (New) The method according to claim 29, wherein said optical characteristic is fluorescence.

43. (New) The method according to claim 31, wherein said optical characteristic is fluorescence.

44. (New) The method according to claim 32, wherein said optical characteristic is fluorescence.

45. (New) The method according to claim 33, wherein said optical characteristic is fluorescence.

46. (New) The method according to claim 37, wherein said optical characteristic is fluorescence.

47. (New) The method according to claim 1, further comprising

(ii) resolving said optical characteristic of said first quantum dot and said second quantum dot attached to said single copy from an optical characteristic arising from a quantum dot not attached to said single copy.

48. (New) The method according to claim 29, further comprising

(ii) resolving said optical characteristic of said first quantum dot and said second quantum dot attached to said single copy from an optical characteristic arising from a quantum dot not attached to said single copy.

49. (New) The method according to claim 32, further wherein said probing resolves said optical characteristic of said first quantum dot and said second quantum dot from an optical characteristic of other members of said population of target species immobilized on said substrate.

50. (New) The method according to claim 33, further wherein said probing resolves said optical characteristic of said third quantum dot and said fourth quantum dot from an optical characteristic of other members of said population of target species immobilized on said substrate.

51. (New) The method according to claim 37, wherein said probing resolves the optical characteristic of said first quantum dot and said second quantum dot from other members of said population and from each other.